

**COLD CRANKING SIMULATOR HAVING  
HYBRID HEAT TRANSFER SYSTEM**

**ABSTRACT OF THE INVENTION**

5 A heat transfer apparatus for use in measuring a rheological property  
of a test sample includes a receptacle for receiving the test sample and a heat  
conveying member in heat transfer relation to receptacle. The heat conveying  
member has internal passages extending substantially equidistantly from one  
another through at least a portion of the heat conveying member to provide for  
counter-flowing circulation of a fluid. A cold cranking simulator includes a hybrid  
10 heat transfer system having heat exchanging elements in heat transfer relation to the  
receptacle responsive to electric current to transfer heat to or from the receptacle.  
The cold cranking simulator further includes a heat conveying member having  
internal passages providing for counter-flowing circulation of a fluid.

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